### **CAPSTONE PROJECT**

### **FACULTY DIGITAL PROFILE BUILDER**

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#### **OUTLINE**

- Problem Statement (Should not include solution)
- Proposed System/Solution
- System Development Approach (Technology Used)
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References



### PROBLEM STATEMENT

Academic institutions require accurate, updated digital profiles of faculty members for:

- Accreditation bodies
- Conference submissions
- Institutional websites
- Funding agencies

#### Currently:

- Profile creation is manual and repetitive.
- Data is scattered across CVs, certificates, papers, and reports.
- Extracting structured information from unstructured documents is difficult and timeconsuming.



### PROPOSED SOLUTION

- We propose building an Al Agent hosted on IBM Cloud that:
- Uses watsonx.ai with Retrieval-Augmented Generation (RAG) to extract structured information from unstructured documents.
- Processes inputs like:
  - CV PDFs / DOCX
  - Certificate images / documents
  - Publication lists / grant proposals
- Outputs:
  - Structured JSON containing profile data.
  - Exportable formats for further use in institutional systems.
- Agent flow:
- $\rightarrow$  Input Document(s)  $\rightarrow$  RAG-based Extraction  $\rightarrow$  JSON Profile  $\rightarrow$  Stored on IBM Cloud Storage / Database



# **SYSTEM APPROACH**

Component	Technology / Tool Used
Cloud Platform	IBM Cloud
Al Model	watsonx.ai Foundation Model (Fine-tuned)
Retrieval Component	IBM Cloud Object Storage + Vector DB (optional)
Workflow Orchestration	IBM Cloud Functions / IBM Watson Studio Pipelines
Data Storage	IBM Cloud Object Storage / Cloudant DB
Document Processing	PyPDF2, docx2txt, Tesseract OCR (for images)
Output Format	JSON, CSV



### **ALGORITHM & DEPLOYMENT**

#### Algorithm

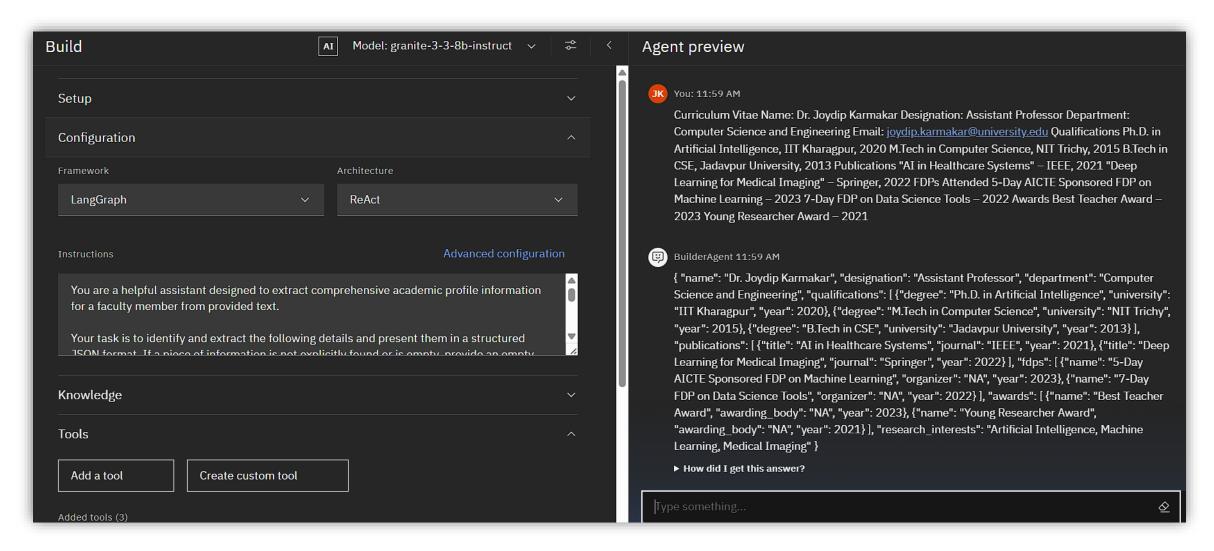
- Input Collection
- Upload CV/documents to IBM Cloud Object Storage.
- Pre-processing
- Convert PDFs, DOCX, images to raw text.
- RAG-based Al Processing
- Retrieve context → Generate structured data (Name, Department, Education, Certifications, Patents, Grants, Publications, Work Experience) via watsonx.ai.
- Post-processing
- Clean, format, and structure data into JSON.
- Storage & Output
- Save JSON to IBM Cloud Storage / Cloudant; expose via API.

#### Deployment

Al Agent on IBM Cloud Functions



### RESULT





### CONCLUSION

The Faculty Digital Profile Builder Al Agent automates the extraction of academic profile data.

Saves manual effort for faculty and administrative staff.

Ensures consistency and completeness of digital profiles.

Hosted entirely on IBM Cloud leveraging watsonx.ai.



### **FUTURE SCOPE**

- Support multi-language document extraction.
- Enable real-time batch processing for entire department profiles.
- Integrate with university ERP systems.
- Add automatic periodic monitoring of new publications (via APIs like Scopus, PubMed).
- Develop RAG pipelines fine-tuned on academic document structures.
- Develop a web solution.



### REFERENCES

- IBM watsonx.ai Documentation
- IBM Cloud Object Storage Documentation
- IBM Cloudant Documentation
- IBM Cloud Functions Documentation
- PyPDF2, docx2txt, Tesseract OCR
- "Retrieval-Augmented Generation" Research Papers
- LangChain / Huggingface Transformers



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This certificate is presented to

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for the completion of

# Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

Completion date: 23 Jul 2025 (GMT)

Learning hours: 20 mins



### **THANK YOU**

